UAV Training and Manpower

Lessons Learned from BAMS Manpower CONOPS

Update for NATSAG
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Tasking

- **Review BAMS UAV Manpower requirements**
- **Review BAMS UAV Training Track Issues**
- **Look at community professional development**
  - Career development

BAMS-Centric Data → Implications on Naval UAVs

Overview for NATSAG

- **BAMS UAV Manpower ConOps Development**
- **BAMS Manpower Requirements**
- **Lessons learned – Issues for UAV MPT**
- **Downwind for VTUAV and J-UCAS (UCAV)**

Purpose and Themes
BAMS Manpower ConOps

Articulate manpower issues while optimizing operational utility of the Broad Area Maritime Surveillance (BAMS) Unmanned Aerial Vehicle (UAV) in the 2010 timeframe

- **Accurately define and capture BAMS Manpower requirements**
  - Quantity and quality
- **"Total Force" approach**
  - Optimal mix of active, reserve and contractor resources
  - Determine knowledge, skills and abilities (KSAs) required for optimal employment
  - Optimum manning may reduce total numbers
- **Leverage existing and enduring trainin**
  - Sea Warrior
    - Total integration and synchronization of MPT
  - Task Force Excel

Focus
Operational employment
"Total Force" approach
Sea Warrior

Take Manpower into account as part of the BAMS system
Develop the system, train the sailor, prepare for battle…

Methodology

Variables

Options

Organization	Air Vehicle	Capability Package	Force Structure	OPS Support Concept	Maintenance Support Concept	Support Concept	Community Ownership	TSC Capability
Squadron	Global Hawk-like	Multi-INT	MMA POR	Contractor	Contractor	O to D	MPR	MSN & Exploit
Detachment (Deploy)	Unmanned Manned Aircraft	RF EO/IR	MMA Reduced POR	Mix	Mix	3 Level	UAV Community	MSN Supp
Detachment (PCS)	Predator-like	Active or Passive	IOC	NAVY	NAVY	Partial O to D	Other	L & R

Variables – factors inside and outside the BAMS lifeline

Organization	Air Vehicle	Capability Package	Force Structure	OPS Support Concept	Maintenance Support Concept	Support Concept	Community Ownership	TSC Capability	Number of Bases	Ship Capability
Squadron	Global Hawk-like	Multi-INT	MMA POR	Contractor	Contractor	O to D	MPR	MSN & Data Exploitation	3	Specifi
Detachment (Deploy)	Unmanned Manned Aircraft	RF EO/IR	MMA Reduced POR	Mix	Mix	3 Level	UAV Community	MSN & Support	5	Trained
Detachment (PCS)	Predator-like	Active or Passive	IOC	NAVY	NAVY	Partial O to D	Other	L & R	7	None

Some options were infeasible

Organization	Air Vehicle	Capability Package	Force Structure	OPS Support Concept	Maintenance Support Concept	Support Concept	Community Ownership	TSC Capability	Number of Bases	Ship Capability
Squadron	Global Hawk-like	**Multi-INT**	MMA POR	Contractor	Contractor	**O to D**	MPR	**MSN & Data Exploitation**	3	**Spec**
Detachment (Deploy)	**Unmanned Manned Aircraft**	RF EO/IR	**MMA Reduced POR**	Mix	Mix	3 Level	**UAV Community**	MSN & Support	5	Train
Detachment (PCS)	Predator-like	Active or Passive	IOC	**NAVY**	**NAVY**	Partial O to D	Other	L & R	**7**	None

5 Alternatives developed

Organization	Air Vehicle	Capability Package	Force Structure	OPS Support Concept	Maintenance Support Concept	Support Concept	Community Ownership	TSC Capability	Number of Bases	Ship Capability
Squadron	Global Hawk-like	Multi-INT	MMA POR	Contractor	Contractor	O to D	MPR	MSN & Data Exploitation	3	Specific
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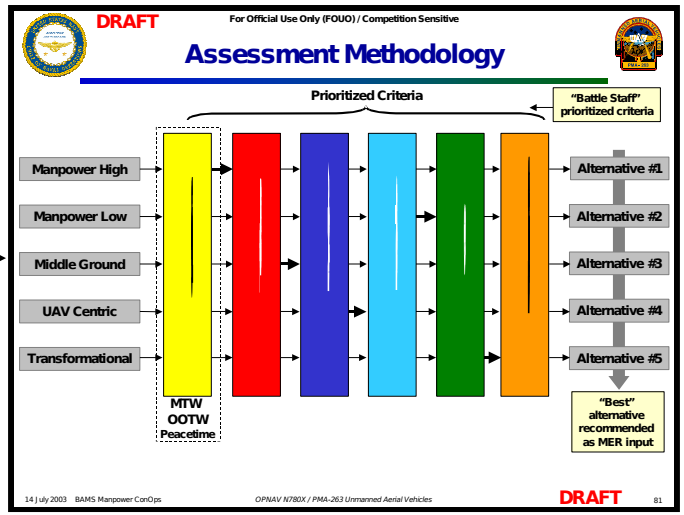
Adequately cover the trade space



Input to MER

How we developed and evaluated alternative approach to man a BAMS unit

Metrics to Evaluate BAMS MP Alternatives

- **Training Filter– "does this option require more training?"**
  - Set requirements (driven by design & ConOps)
    - Common skill sets for maintainers, operators and support (TSC), leverage from existing/projected capability
    - Discrete skill sets
      - Drive up Individuals Account (IA)
      - Increases instructor load / numbers
  - Complexity of tasks
    - Complexity drives up aptitude requirements, increasing personnel costs to include recruiting & retention
    - System design should be simple enough to be operated by the average sailor

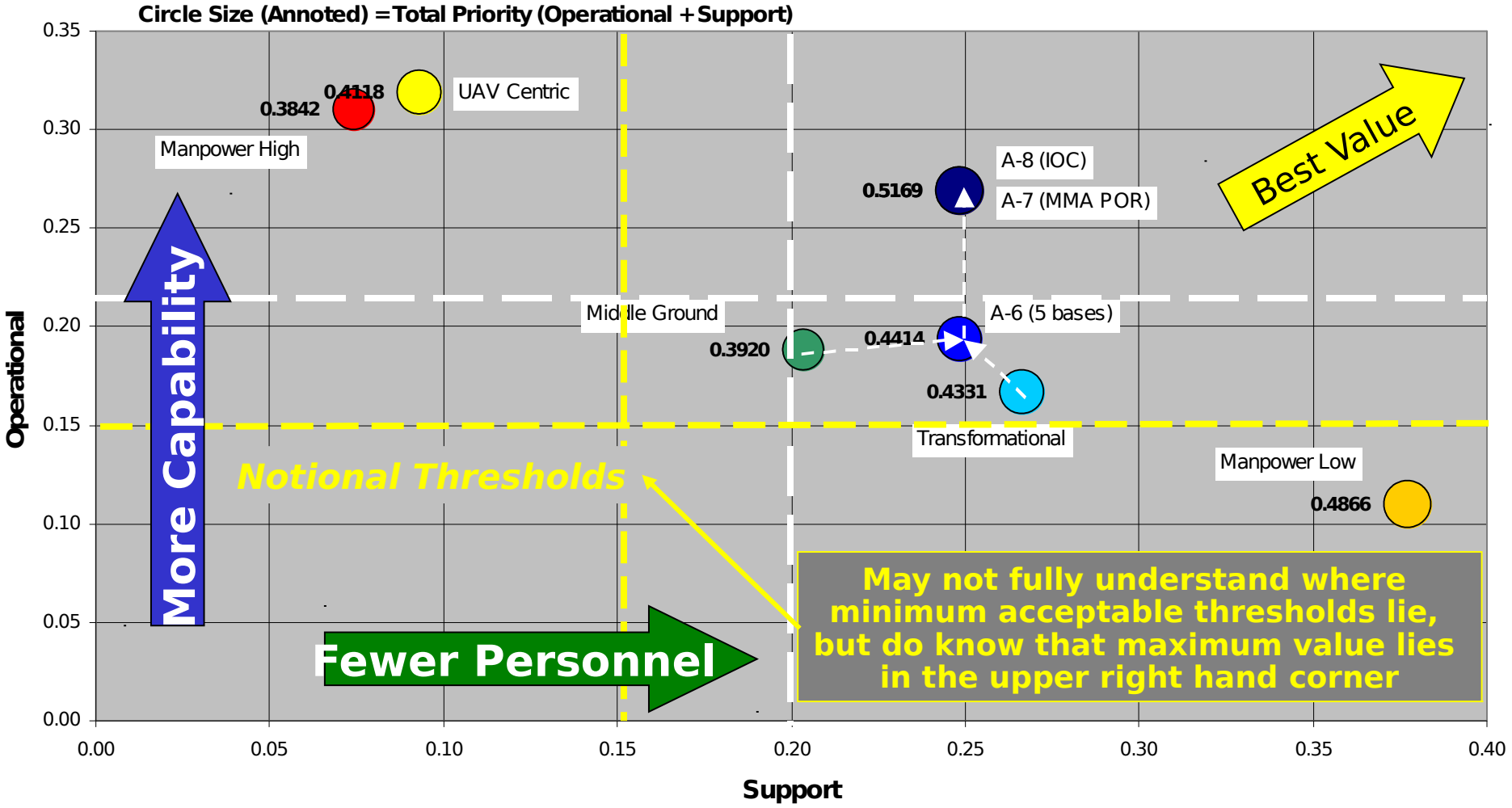
- **Manpower Filter –**
  - End-strength impact for active and reserve force - *Quantity*
    - Worst Case: Zero sum addition to total force (active, reserve, GS, contractor)
  - Discrete billet drivers - *Quality*

Metrics to Evaluate BAMS MP Alternatives

- **Personnel Filter**
  - Recruiting requirements
  - Retention requirements (SRB, QOL)
  - Community management costs
    - Discrete requirements are costly
    - Tangible: this option does or does not support promotion
    - Intangible: Perception as second class citizen = $

- **Cost Filter**
  - Infrastructure
    - Squadron spaces, FRS, TSCs, logistics, housing
  - Personnel
    - Life-cycle cost
      - Salaries, travel, TAD, PCS, retirement accrual ….

BAMS MP Assessment Results

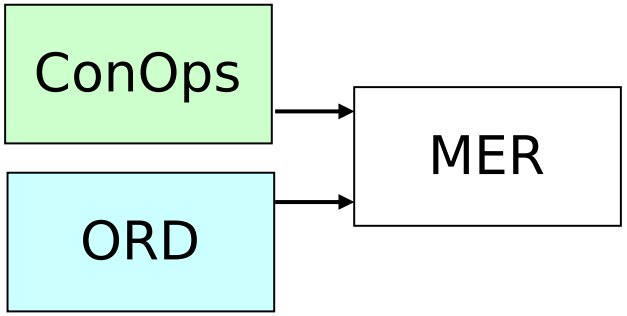


- Alternatives 7 & 8 evaluated identically, baseline capability is the same, availability of manpower to augment operations is comparable

Results of BAMS Manpower ConOps

Preferred Manpower Options

- Contractor Logistics Support (CLS)
- VP Community leadership
- Shore Duty billets
- “Squadron” type organization
- FRS training done at CONUS squadron
- Mission aircrew: ½ Military
  ½ Civilian
- Contractor responsible for maintenance training
- FRS produces “full up rounds”
- All knowledge, skills, and abilities available in civilian sector



Active Duty Manpower Requirements

	O-5	O-4	O-3	O-2	TOTAL
13XX	10	13	30		53
1520			1		1
1630			5		5
6330			5		5
TOTAL	10	13	41	0	64

	E1-3	E4	E5	E6	E7	E8	E9	TOTAL
APO					5	5	1	11
AW			10	12				22
ET				1				1
EW			10	12				22
IS				15				15
PN			1					1
YN				5	5			10
TOTAL	0	0	21	45	10	5	1	82

64 Officers

- **53 pilots and NFOs (13XX)**
  - Second tour (shore duty)
  - VP, VQ, VS, VAW, VAQ background
  - Potentially HS and HSL
- **5 Intel Officers (1630)**
  - Shore duty following first sea tour
  - VP community?
- **6 Maintenance Officers (1520 / 6330)**

82 Enlisted

- **45 Aircrew**
  - E-4,5,6 aircrew qualified (N1)
  - VP, VQ, and HS/HSL
  - Other communities – OS ?
- **15 Intel Specialists**
  - E-4,5,6,7
- **Other (Maintenance / Admin)**
  - 11 / 11

* #s at FOC

UAV MPT Issues

Manpower	Personnel	Training
• Total Force Mix • Hybrid and dual qualified • Maintenance concept - e.g., level of CLS • Organization • Community Sponsor • Mission data exploitation - Unit, supported cmd, and reachback	• Sea / Shore rotation • Distribution • Community management • Career path • Source of ratings	• FRS • Skill set consolidation • Training continuum • KSAs

BAMS Example
Sensor Exploitation

- **UAV Sensor Exploitation**
  - BAMS UAV
    - MCS (unit level) screening and tactical utilization
    - Centralized exploitation at reachback facility or facilities
      - Mission and task driven
  - VTUAV and UCAV ??
    - MCS tactical manipulation
    - Limited screening
    - Shipboard tactical exploitation
      - Assumes UAV supporting mission commander (CAG, DESRON, CARGRU)
  - Shipboard (or other platform) control of UAV and / or sensors
    - MPT impact especially training and currency
  - Potential for large MPT impact outside UAV lifelines
    - Study underway to determine required support functionality and conduct gap analysis – results due out late this year

Specific BAMS MP Issues for N20

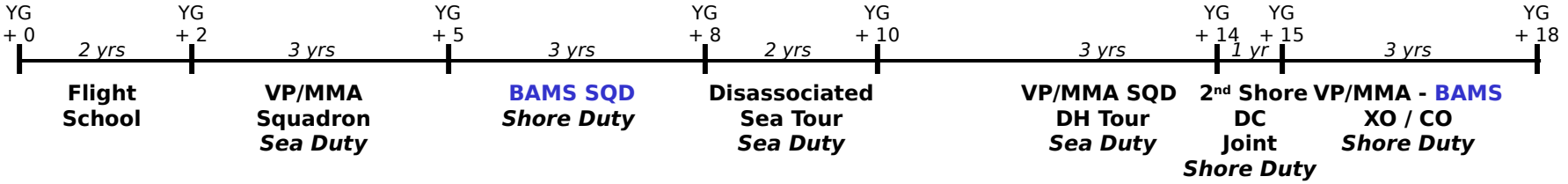
- **N2 relevant personnel factors for BAMS operations**
  - What type of skills needed to support BAMS missions?
    - Officer (LDO & WO), IS, CT, NEC specific
    - Planning, execution, exploitation tasks
    - Civilians feasible for any billets ?
  - What is attractiveness of UAV squadron assignment ?
    - Officers as potential mission watch officers ? WO & LDO's ?
    - Opportunity for Intel Pers to excel, or overload ?
  - What is impact on N2 manpower pool ?
  - Manning requirements for normal and surge or combat operations
  - Reachback support at various echelons
    - ONI, COMCDR, Fleet, numbered fleet, CSG, ESG, ...
  - New CNO Manpower Policy impact
    - Example: IS stand watch as BAMS sensor operators ?

- **Other issues impacting or relevant to Intel community**
  - Near term and far term N2 objectives (e.g., FIST)
  - Overseas BAMS billets - sea or shore ?

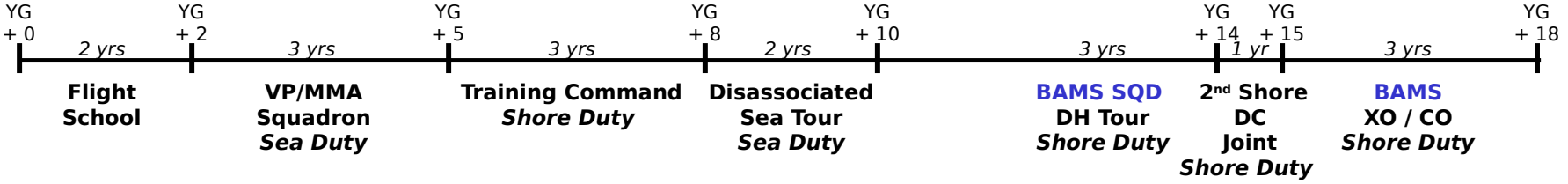
BAMS Example

Pilot / NFO Career Paths

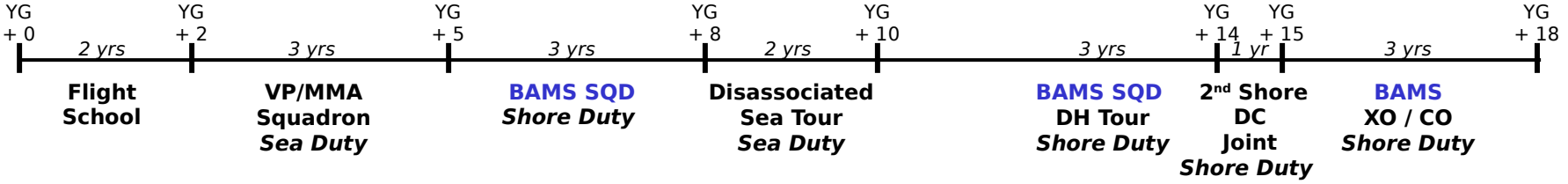
VP Centric



No VP DH Screen



BAMS Centric



BAMS Example
UAV KSAs

- **UAV Aircrew – "We're not in Kansas anymore, Toto"**
  - Pilots / Mission Commanders
    - FAA currently requires instrumented rated pilot available to operate in U.S. controlled airspace – likely to change during the FYDP
    - Required KSA's point to mission experience, not stick & rudder experience
  - Aircrew and Sensor Operators
    - Not just sensor manipulators - must interpret and screen data, tactically employ sensors and make decisions
    - Commonality of sensors and control systems point to common UAV KSA's
  - Long term community management
    - Source ratings and communities for UAV aircrew can and should extend beyond 13XX and aviation ratings
    - Subject to military essentiality requirements, contract aircrew a viable solution
  - Training
    - UAV aircrew will generally be 2nd tour
    - Centralized UAV basic training followed by unit based mission / sensor training
      - Every UAV squadron is a mini-FRS
        - But mission crew arrives on station ready to fly

UAV MPT Downwind …

- **BAMS UAV Intel Support Manpower Study**
  - Thoroughly explore UAV sensor data exploitation issues
  - Establish Intel support requirement
    - Manpower, organization and infrastructure
  - Results in March 05 – will most likely impact all UAV programs

- **Fire Scout (VTUAV)**
  - Manpower ConOps, MER, NTSP underway
  - Limited potential for CLS due to sea-based operations
  - Integration with LCS and HS / HSL communities presents challenges and opportunities

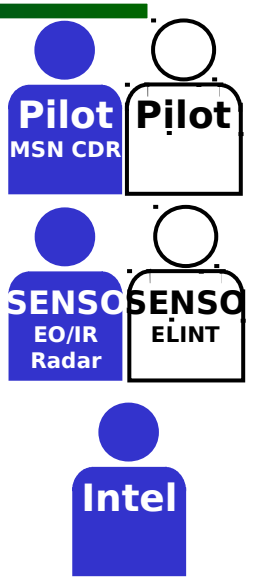
- **UCAV**
  - Most demanding KSA's for UAV flight crew at first look
  - Potential operational integration with manned aircraft – challenges
  - Underscores issue of weapons release authority – who pulls trigger
    - Different than manned aircraft where this is normally not an issue ?

- **Programmatic impacts of Sea Warrior, TF Excel, Sea Print**
  - At what point will these programs be effective ?

BACKUPS

Mission Crew Composition

- **Pilot* (MSN CDR)**
  - Naval Officer (always)
  - Military pilot or Naval Flight Officer with FAA certification
- **Pilot***
  - Military pilot or Naval Flight Officer with FAA certification, or…
  - Contractor provided operator with comparable KSAs
- **SENSO 1 (EO/IR - Radar)**
  - Navy sensor operator
    - AW, EW, CT, OS, IS
  - Contractor provided operator with comparable KSAs
- **SENSO 2 (ESM)**
  - Navy sensor operator, or…
    - AW, EW, CT, OS, IS with appropriate KSAs
  - Contractor provided operator with comparable KSAs
- **Intel Specialist**
  - Navy Intel Specialist
    - IS
  - Contractor provided operator with comparable KSAs



**** Pilot refers to an aviator qualified by FAA and ICAO standards***

Crew Tasks and Responsibilities

Knowledge, Skills & Abilities (KSAs)

- **Mission Commander**
  - Responsible for UAV safety of flight
  - POC for coordination with supported commands
  - Pilot station duties
  - KSA for Maritime Dominance MSN
    - VP, VQ, VS, HS, HSL type skill

- **Pilot**
  - Mission planning
    - Includes input to supported commands mission plans
  - UAV control
  - Launch and recovery
  - Flight and MSN plan adherence
  - Position UAV to employ sensors
  - Adjust flight track when mission tasks or priorities change
  - Employ sensors when necessary
  - KSA for Maritime Dominance MSN
    - Fleet aviator experience probably adequate

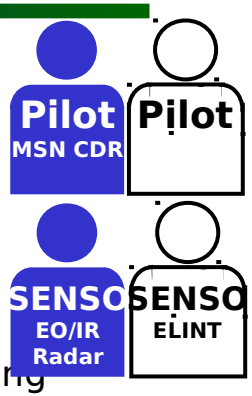
- **SENSO 1 (EO/IR - Radar)**
  - Support mission planning
  - Plan sensor employment
  - Process sensor data
  - Recommend actions to MC / supported command
  - Recommend flight path adjustments to optimize sensor employment
  - KSA for Naval Aircrewman, OS, IS, other

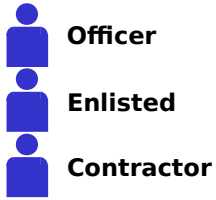
- **SENSO 2 (ESM)**
  - Same tasks as SENSO 1
  - KSA for EW, CT
    - Also OS, AT, IS with formal training

- **Intel Specialist**
  - Support mission planning to factor Intel specific needs
  - Prepare and brief Intel section for mission
  - Perform ad hoc assessment of data collected within MCS capability
  - Screen data and forward high interest items to supporting reach-back facility for exploitation
  - Prepare mission and post-mission reports

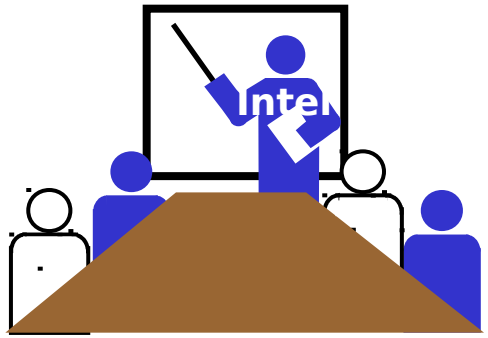
Mission Crew Management
Descriptions

- **Flight Crew**
  - Number (50% contractor)
    - 8
  - Composition
    - 2 pilots, 2 SENSOs per crew
  - Work Hours
    - 32 (avg)
  - Tasks
    - Performs launch, recovery of the Air Vehicle (A/V). Executes mission tasking
    - Monitors A/V systems condition
    - Tactically employs A/V to support of Operational CDR
    - Executes dynamic re-tasking when required





- **Intel Support Crew**
  - Number (50% contractor)
    - 8 (tied to flight crews)
  - Composition
    - 1 Intel per crew
  - Work Hours
    - 40 (avg)
  - Tasks
    - Intelligence collection planning
    - Performs pre-mission, mission and post-mission analysis of collected data to tactically optimize A/V employment
    - Insures high priority collections are forwarded to appropriate agencies
    - Assists with A/V re-tasking in order to optimize collections
    - Briefs mission crews prior to event on intelligence, tasking, threat, performs debrief



Manpower ConOps Cost Drivers

Large

Manpower Requirement Impact

Small

Driver	Change	Program Impact	FY14 * Impact
Total Force Mix	100% active duty	743 versus 146, net 597 (43O / 554E) increase in end strength offsets required.	-$34.7M **
Number of Sites	+/- 1 Site	12 Officer, 15 Enlisted, 92 CLS.	$18.9M
Ops Force Mix	100% active duty	40 O/60 E increase in end strength offsets required. No impact on total force requirement.	-$9.1M **
Type of Duty	Sea versus shore at 1 site	Sea duty provides longer work weeks for military but need more billets for optempo/perstempo balance.	$8.5M ***
Crew Make-up	+/- 1 O/E at five sites	Crew size at each site. Drives total crew requirement. Would eliminate contractor position in mixed ops conops.	$7.5/5/0 M
Number of Crews	+/- 1 Crew at five sites	Crew size at each site. Drives total crew requirement.	$6.2M
Number of Vehicles	+/- 1 Vehicle at five sites	Impacts maintenance manpower requirement but a decreasing function.	$3.2M
Number of GCS per site	+/1 1 GCS at five sites	Impacts maintenance manpower requirement but a decreasing function.	$1.4M
Size of FRS	10% Increase in throughput	Driven by training requirements and number of vehicles at RAG.	$0.4M

** FY14 reflected as FOC. Manpower costed using NAVAIR 4.2.1 fully burdened rates.*
*** Operational crew: pilot, senso, intel support.*
**** Assumes 1:3 OPTEMPO/PERSTEMPO and 33.3/60 hour workweek, PCS/TEMDUINS/AIP not considered.*